

Didactic actions to develop Aerobic Resistance in undergraduate students in Pharmaceutical Sciences

Acciones didácticas para desarrollar la Resistencia Aeróbica en estudiantes de licenciatura en Ciencias Farmacéuticas

Alexander Cabrera-Rodríguez¹, Yanet Pérez-Surita², Maday Rodríguez-Marañón³

¹Lic. Profesor Asistente. Universidad Central “Marta Abreu” de Las Villas. Villa Clara, Cuba.
alexanderc@uclv.cu

²Dr.C. Profesor Titular. Universidad Central “Marta Abreu” de Las Villas. Villa Clara, Cuba.
yanetsurita@uclv.cu

³Lic. INDER Municipio Ranchuelo, Villa Clara, Cuba. madayrm@nauta.cu

Date of reception: June 16, 2020.

Date of acceptance: August 6, 2020.

ABSTRACT

The article responds to the necessity of improving the Aerobic Endurance in the formation of the professional of students of the career Degree in Pharmaceutical Sciences by means of didactic actions that lead to the knowledge and importance from a physical-educational dynamics starting from implementing them driving to the understanding of a Contemporary Physical Education. It was worked with a deliberate sample of 22 students of first year of the career between 17 and 19 years old, 5 males and 17 females. Theoretical methods were applied as the analytic-synthetic, inductive-deductive; of empiric level the observation, the survey, the analysis of documents, the mensuration and statistical methods in the analysis of the developed tests.

Key words: Didactic actions; Physical education; Cultural formation; Aerobic resistance

RESUMEN

El artículo responde a la necesidad de mejorar la Resistencia en los estudiantes de la carrera Licenciatura en Ciencias Farmacéuticas mediante acciones didácticas que conduzcan al conocimiento e importancia desde una dinámica físico-educativa a partir de implementarlas conduciendo a la comprensión de una Educación Física Contemporánea. Se trabajó con una muestra intencionada de 22 estudiantes de primer año de la carrera

entre 17 y 19 años de edad, 5 varones y 17 hembras. Se aplicaron métodos teóricos como el analítico-sintético, inductivo-deductivo; de nivel empírico la observación, la encuesta, el análisis de documentos, la medición y métodos estadísticos en el análisis de las pruebas realizadas.

Palabras clave: Acciones didácticas; Educación física; Formación cultural; Resistencia aeróbica

INTRODUCTION

To achieve a professional future with a solid cultural background, Physical Education constitutes an important framework in a process characterized by its comprehensiveness and differentiation in relation to the educational needs and interests of future professionals. It has the imperative of incorporating new content into the training of university students and applying the methods that adjust to the specific physical demands required by the exercise of the profession and the technological advances of the practice in Physical Education, based on a training approach comprehensive and developer.

Physical Education as a subject, constitutes a process aimed at developing the physical performance capacities of the individual, based on the morphological and functional performance capacities of their organism, the formation and improvement of their moral and volitional qualities that has as purpose to contribute to the improvement of our children, adolescents and young people through physical, sports and recreational activities and thus contribute to the instruction and education of a young person capable of actively and consciously conducting himself at the service of building society, a young healthy with a multilateral development of their physical qualities and abilities.

From the pedagogical point of view, it promotes the integral formation of the human being, either through the practice of sports, in classes designed for gyms or sports areas; or simply physical exercises in the home or area of residence or the workplace, it is the only effective alternative to maintain physiological potentialities, physical capacity for work and maintain optimal health (Rodríguez, Moré, & Gutiérrez, 2019).

The work of resistance and within it aerobics is the basis for the development of the subject, resistance allows those who possess it, to prolong their effort, or to recover as soon as possible from that effort.

Therefore, it should be noted that Aerobic Endurance is one of the fundamental pillars in the physical preparation of every individual throughout his life, which forms one of the four basic physical capacities, and whose benefit is reflected in the body (increased respiratory capacity, muscular vascularization, increased energy reserves, etc.) and physical performance (increased aerobic endurance, rapid recovery and greater elimination of waste substances, etc.).

It is necessary and important for students to know what Aerobic Endurance is, the importance it has for health and how to improve it in practice, building theoretical knowledge about physical condition, learning how to achieve it, knowing how to plan and control their development process, all this as a way to stay healthy and optimistic in the achievement of your goals. In other words: install a physical culture in our citizens with autonomy in the planning and control of their physical condition.

The diagnosis made to students of the Bachelor in Pharmaceutical Sciences of the Central University "Marta Abreu" of Las Villas through the

Observation in classes, the initial physical condition test where the 800 meters race was measured, the Cooper test and the survey, allowed to observe symptoms of fatigue in the students when performing physical activities; low levels and ignorance about Aerobic Endurance in the training of the professional; lack of didactic actions for the regulation and self-regulation of the impact on the physical development of the university student.

From a methodological and practical point of view, there are no didactic resources that allow to enhance individual and social development, capable of promoting independence and creation. This evaluative and critical analysis from the theory, from a process of scientific abstraction, allows to recognize the existence of the scientific problem of the investigation defined in: Didactic deficiencies in the development of Aerobic Resistance of the students of Bachelor of Pharmaceutical Sciences who are They manifest during the execution of actions that require

physical effort and limit the growth of the Aerobic Capacity to comply with the quality of the activity.

When referring to the physical activity carried out by the Bachelor of Pharmaceutical Sciences and understanding the epistemic insufficiencies that affect the problem under study, which establishes the imprint of a dialectical relationship and causal value determination in the logic of this research, it is expressed in: Aerobic Endurance development strategies from Physical Education are linked to professional training, relative to the efforts and scenarios where such training is developed. There is no adequate epistemological and praxiological systematization of Aerobic Resistance during the development of the Labor and Research Practice of the Bachelor of Pharmaceutical Sciences. Prevalence of learning methods, styles and approaches in the teaching-learning process of Physical Education that do not achieve an improvement in the integral Physical Condition of the student that limits the development of Aerobic Endurance.

The following objective is derived from the existing problems: Propose didactic actions that lead students to the knowledge and importance of the Aerobic resistance from a physical-educational dynamic, concerning the training of the Bachelor of Pharmaceutical Sciences.

METHODS

Historical-logical: this allowed to contextualize the object in its evolution, with emphasis on the treatment of violence and its link with the work of psychomotricity, and conceptualization of the main changes around the problem.

Review of primary sources, based on the analysis and criticism of the sources of information: it was used to study the materials related to the object of study and the defined field of action, supported by the logical procedures of thought: analysis-synthesis, induction-deduction and hypothetical-deductive. Systemic-structural-functional: it was used with the objective of determining the relationships, structure and hierarchy between the different components that are contributed in the investigation.

Unstructured observation: it allowed to verify in the setting where part of the research was carried out and their behavior, exposing the main insufficiencies that

lead to violence from the informal route in girls and boys who exercise caregivers in certain communities.

Although the research in the project phase is consolidated to the extent that other instruments such as the experiment are used: to determine the validity of the hypothesis proposed by a pre-experiment design, an initial test is applied, the treatment (independent variable) and a final test taken as a criterion for comparison.

The measurement of other necessary instruments: it was used in the variables related to psychomotricity and violence prevention, as these metrics are continuous and are on a scale of relationships or proportions.

Mathematical-statistics: using descriptive statistics, a set of data was ordered, analyzed and represented, in order to describe the current state of violence at these ages and how these illnesses can be prevented through psychomotor work, which This study is complemented by inferential statistics, with methods and procedures by means of induction, the properties of a statistical population were determined from a part of it.

Survey: in order to know the current changes in society and their behavior, it was applied to the subjects of the sample, before knowing the problem and after the problem, applying possible solutions.

Some characteristics to take into account at these ages

Child psychomotricity: Changes during child development

Psychomotor development follows patterns of evolution largely marked by the child's age.

Child psychomotricity during the first year:

- The parts of the body closest to the head are controlled, extending control to the arms and later to the legs. An example of this would be the child controlling the movement of the shoulder first, then the arm and wrist, and finally the hand and fingers.

Child psychomotor from 1 to 2 years:

- Child acquires great independence with her movements. Without help, he crawls, looks back, plays construction and lace games, runs, jumps, synchronizes arms and legs, can hit a ball ...

- Able to imitate some gestures.
- Scribbles.
- Identify some parts of the body.
- Use the spoon.
- Helps to dress and undress.
- Manages to use short and simple sentences.

Child psychomotor from 2 to 3 years:

- They start riding a tricycle.
- Climb stairs (not down them).
- Dress or undress alone (no buttons or zippers).
- Eat without help.
- Besides making doodles, he makes stripes and likes to paint.

Child psychomotricity at 3 years:

- Spontaneity and ease in movements.
- Dominates the body itself, differentiates parts of the body in itself and in others.
- It moves in the race and stops.
- Has greater coordination and precision in tasks
- Complete drawings and figures.
- Begins to handle basic notions of space and time such as up-down, front-back, before-after, quickly-slowly.

The main disorders of psychomotor development are:

- Motor weakness: clumsiness in movements and inability to relax muscles voluntarily.
- Motor instability: inability to inhibit movements, as well as the emotion that accompanies them.
- Motor inhibition: tension and indifference in social contexts, show fear of social interactions, are afraid of falling, insecurity, inhibit their movements with the aim of becoming invisible.

- Disorder of the body schema or laterality: difficulty in acquiring knowledge and representation of the body itself. It is difficult for him to use space-time orientation and to use his body effectively to relate to the environment. An example of this disorder would be a child who at three years old does not identify the elements of his face.
- Child apraxias and dyspraxias: the child knows the movement, but is unable to do it correctly, does not coordinate activities and cannot imitate simple gestures
- Tics or Tourette's Disorder: sudden, involuntary movements that affect small muscle groups and recur intermittently. They can be chronic or transitory.
- Synesthesia: involuntary movements that are born while doing other activities (an example would be sticking out the tongue while painting)

RESULTS

Theoretical considerations about improving Aerobic Endurance in college students. University schoolchildren live a stage characterized by intense learning processes, by the search for their own identity and by unprecedented cognitive, emotional and social changes. In this period, health promotion and education face great challenges and enormous possibilities because attitudes, values and behaviors are forged, and the foundations of lifestyles are built.

Aerobic Endurance in the university environment helps to identify factors that lead to a series of problems, specific situations commonly associated with a high risk in the development of chronic cardiovascular diseases, but it is not found as a responsible or main determinant since there are various factors for which will have to generate a series of associations to take into account.

Aerobic Endurance in the university student is vitally important as it strengthens the heart; decreases the number of beats per minute; maintains blood pressure; increases the number of capillaries; increases HDL cholesterol; Raises the maximum oxygen consumption; an optimal relationship is established between fat and body mass etc...

Studies carried out have found in young people that aerobic capacity is associated with physiological health parameters such as insulin resistance, adiposity or lipid profile, factors linked to metabolic syndrome and arterial resistance; The relevance

of aerobic capacity as an indicator of cardiovascular risk has been described. Juranková, Bílý, & Hrazdára (2015); Lema, Mantilla, & Arango (2016) y López-Martínez et ál. (2013). In the other hand, Galera (2013) proposes a set of systematic didactic factors for the educational initiation of aerobic resistance, focusing on methods applicable to the school reality from a sustainable perspective.

Benítez, Estupiñan & Montalvo (2016) it implements didactic actions that lead students to the apprehension of a culture of integral physical self-realization. Among the activities that help improve Aerobic Endurance are: Take walks, excursions; sports and pre-sports games; racing games, jogging, running; aerobic exercises or dance therapies; ride the bicycle; swim etc...

When carrying out the 800-meter race of the Physical Efficiency Tests, the low levels of Resistance were observed, so it was determined to carry out the Cooper Test to see to what extent the Aerobic Endurance was affected, yielding low indices of physical capacity.

The ACSM (1999) mentions that this is one of the most used tests to assess aerobic capacity. It provides a reliable estimate of aerobic capacity, or Oxygen Consumption, yet does not require expensive laboratory equipment. It can be used by people of all ages, and large groups can be tested at the same time.

This test allows us the simultaneous assessment of several subjects, without the need for overly sophisticated means and with few control personnel.

Table # 1 shows the result of the statistical analysis of the 800-meter race.

Table 1. Statistical analysis of the 800-meter race of the Physical Efficiency Tests (PEF)

	PEF(Male)	PEF (Female)
Quantity	5	17
Half	3,95	5,37
level	IV	S/N
Median	4,25; 4,30	5,44; 5,47
fashion	-	6,08
Rank	0,95	2,11

There are several fashions. The smallest of the values will be displayed

Table # 2 shows the result of the statistical analysis of the Cooper Test.

Table 2. Statistical analysis of the test: Cooper

	Distance traveled	Distance traveled
Quantity	5	17
Half	1950	1550
Level	Very bad	Very bad
Median	1900; 1930	1460; 1500
Fashion	-	1250
Rank	140	400

There are several fashions. The smallest of the values will be displayed

The results of the survey show the ignorance of the students of the group about the importance of Aerobic Endurance.

6 students know about aerobic endurance based on the following: 6 physically develops the body; 2 decreases the risk of cardiovascular diseases; 2 improves oxygen transport and 6 that is developed through aerobic exercises such as long distance running, jogging, cycling. 16 students are unaware of Aerobic Endurance.

The didactic actions that are proposed become an alternative that allows orienting students towards a development of the physical-educational dynamics in the training of the graduate in Pharmaceutical Sciences, within physical activity, they represent the identification of motor actions contextualized in the diversity of tasks supported by motor action that fosters the realization of the skills and physical demands demanded for the execution of the fields of action in the training context.

Before putting the actions into practice, it is necessary to carry out an exhaustive work with the students on the levels of Aerobic Endurance, in order to characterize and identify from the physical-educational point of view the physical activity that is required to improve it as well as assess with What resource from the didactic point of view is counted to develop the training process, therefore it is necessary to assume general and specific didactic requirements and actions of Physical Education which are presented below:

Didactic actions to develop Aerobic Endurance in students of the Bachelor of Pharmaceutical Sciences career.

For the conception of the didactic actions, the fulfillment of the didactic actions established in the Cuban school is assumed as a basic foundation, as they constitute the theoretical postulates or guiding ideas that allow teachers to conduct

the pedagogical process with quality and efficiency; It was emphasized that the structuring and dynamics of the proposal is based on compliance with the system of principles: The unity of education and scientific instruction; the linking of theory with practice; planning and systematization; the leading role of the teacher; accessibility; affordability and individualization; the gradual and progressive increase of the loads and the dosage between the structure of the external and internal loads.

Teaching Requirements:

- Use productive methods in Physical Education classes that develop Aerobic Endurance in the student.
- Dose the development of Aerobic Endurance through aerobic exercises.
- Regulate and evaluate physical loads in classes through interactive didactic actions that stimulate search, reflection and scientific knowledge of the organism.
- Students must actively participate in directing the process from its conception and initial organization to the analysis of the final results. The assessment of loads must have as comparative references internal indicators and individualized requirements.

Didactic actions:

- The interaction of students with their body and the socialized study of their behavior with the teacher.
- Heart rate control through pulsometry.
- Preparation of physiological curves and their evaluation.
- Carrying out a personalized, evaluative and reflective report on the behavior of the impact of Aerobic Resistance on the development of the university student.

Formative intent of the study

A methodological line to work is required that consists of the implementation of the physical-educational dynamics in the training of the Bachelor of Pharmaceutical Sciences student, in which didactic actions aimed at developing Aerobic Resistance are oriented. In this regard, the insufficient didactic resources available

to teachers to implement didactic actions that lead to the formation of future graduates assumed among the theoretical foundations of the research are defined as a conceptual problem.

Objective: To develop methodological instructive activities that allow the student to achieve a comprehensive physical development of Aerobic Endurance in the practical realization of the physical-educational dynamics.

It is developed with the intention of preparing the student from Physical Education, their active participation in the execution of the corresponding actions in each of its phases.

Phase No 1:

- Coordinate the development of the physical-educational dynamics and its link with the physical demands in the development of Aerobic Endurance.
- Diagnose the physical educational needs of the student in the development of Aerobic Endurance.

Phase No 2:

- Planning of physical educational activities to develop from the Physical Education class itself.
- Training for the professors of the degree, of the year and of Physical Education who intervene in the training of the future graduate of Pharmaceutical Sciences.

Generalización de las acciones didácticas para desarrollar la Resistencia Aeróbica en los estudiantes de licenciatura en Ciencias Farmacéuticas.

Objective: Practical application of didactic actions by teachers and students.

The contents are the synthesis of the dialectical relationship that is established between the perception of the motor condition and the identification of the particularities of the motor actions that distinguish the physical demands of the university student in their curricular training, this is possible at another level of relationship Dialectic between the orientation of didactic actions when considering the physical demands of the development of physical capacity materialized in the generalization of experiences that has its synthesis in an increase in Aerobic Endurance through the reciprocal student-teacher bond, which has allowed the formation of a comprehensive physical culture.

In order to comply with a Physical Education aimed at the training of the professional in the midst of the physical and technological demands that the university student requires, the teacher, through a theoretical-methodological support, develops activities that promote the active participation of students to through socialization in the direction of physical activity. These students, by interacting with their body and with new technologies, ensure the realization of a pedagogical process through integrative physical activities that stimulate them to the appropriation and application of the knowledge and intellectual skills acquired in the educational context and future working life.

In this sense, it is based on the student knowing what their ideal heart rate is from determining their maximum heart rate, in this way they are involved in the scientific search for knowledge with the intention of forming an integral physical culture from the subject of Physical education.

Formative and qualitative evaluation of the didactic actions used to develop Aerobic Endurance.

Objective: Assessment of a comprehensive physical activity of the student through continuous monitoring of the training process.

The evaluation of the didactic actions encourages an assessment of the physical transformations in the students manifested throughout the training process and the orientation of didactic actions is also estimated and developed by being reasonable with the Scientific Conception of the Holistic-Configurational that supports the model of the physical-educational dynamics in the formation of the Pharmaceutical Sciences student.

The formative evaluation should not pretend to add achievements of objectives, but rather to verify how these objectives are integrated to contribute to achieving a development of Aerobic Endurance in the profile of the Bachelor of Pharmaceutical Sciences.

CONCLUSIONS

With the proposal of didactic actions aimed at developing Aerobic Endurance, the dynamics of the teaching-learning process of Physical Education in the training of the Bachelor of Pharmaceutical Sciences is perfected. The proposal of didactic

actions aimed at developing Aerobic Endurance contributes to a good physical preparation of the university student.

BIBLIOGRAPHIC REFERENCES

American Collage of Sport Medicine ACSM (1999). Manual ACSM para la valoración y prescripción del ejercicio. Paidotribo. Barcelona, España.

Benítez, J., Estupiñan, J. & Montalvo, I (2016) Acciones didácticas para la autorrealización física integral de los estudiantes de carreras agropecuarias.

Didasc@lia: Didáctica y Educación. ISSN 2224-2643

Cooper, K. (1979). El camino del aerobico. Ed. Diana. México

Galera, A. (2013) Iniciación educativa a la resistencia aeróbica. (I) La carrera económica. Apunts. Educación Física y Deportes 2013, n. ° 113, 3.er trimestre (julio-septiembre), ISSN-1577-4015. Universidad Autónoma de Barcelona (España).

Juranková, M., Bílý, J., & Hrazdíra, E. (2015). Effects of high-intensity strength interval training program on body composition. Journal of Human Sport and Exercise.

Lema, L., Mantilla, S., & Arango, C. (2016). Asociación entre condición física y adiposidad en escolares de montería, Colombia. Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte. <http://dx.doi.org/10.15366/rimcafd2016.62.007>

López-Martínez, S., Sánchez-López, M., Solera-Martínez, M., Arias-Palencia, N., Fuentes-Chacón, R., & Martínez-Vizcaíno, V. (2013). Physical activity, fitness, and metabolic syndrome in young adults. International journal of sport nutrition and exercise metabolism. Doi: <http://dx.doi.org/10.1123/ijsnem.23.4.312>

Rodríguez, A., Moré, M., & Gutiérrez, M. (2019). La Educación Física y la educación para la salud en función de la mejora del rendimiento físico de los estudiantes. Universidad y Sociedad. Recuperado de <http://rus.ucf.edu.cu/index.php/rus>.